

Federal Communications Commission
Office Of Science And Technology
Washington, D.C. 20554

INTERPRETATIONS OF THE FCC
RULES FOR COMPUTING DEVICES
(PART 15 SURPART J)

Bulletin OST 52
June 1981

The Federal Communications Commission has adopted new rules designed to reduce the interference potential of digital electronic equipment (defined as computing devices) to radio communications. The new rules impose minimum technical standards for such electronic devices or systems.

The new regulations for computing devices were adopted on September 19, 1979 and released on October 11, 1979 by First Report And Order in Docket 20780 (44 FR 59530). The rules were revised on reconsideration. The revised rules are appended to the Order Granting In Part Reconsideration in Docket 20780 adopted on March 27, 1980 and released on April 9, 1980 (45 FR 24154). The requirements for computing devices are set forth in Subpart J of Part 15 of the Rules (47 CFR 15, Subpart J).

In a related proceeding, the Commission established methods of measurements to be used to show that computing devices comply with the FCC's new technical standards. These procedures are set forth in a Report and Order in FCC General Docket 80-284 (46 FR 23240).

There are several other Commission actions concerning the computing device requirements. By Report and Order in Docket 80-439 (46 FR 19479), the Commission clarified which electronic games are exempted from certification under Section 15.834. The date for compliance of coin-operated games was stayed by Order dated December 4, 1980 (FCC 80-706, 45 FR 83502) to permit time to consider a petition to revise the rules for coin-operated games. In an Order dated December 4, 1980 (FCC 80-708, 45 FR 83502) the interim labelling requirement of Section 15.805 was waived for medical products, to allow time to consider a petition for relief for such devices. An extension of time to comply with the certification requirement for personal computers was granted to Heath Co. and Apple Computer Inc. by Order dated December 4, 1980 (FCC 80-708, 45 FR 83502).

Copies of each of these documents may be obtained for a nominal charge from the FCC duplicating contractor:

Downtown Copy Center
1114-21st St., NW
Washington, D.C. 20037
202-452-1422.

The Commission established a Computing Device Panel to answer questions about the new computing device rules. Manufacturers and others seeking guidance concerning the new rules were invited to consult with the panel or submit written inquiries. This Bulletin presents, in question and answer form, a representative sampling of the questions that have been received by the panel to date and the responses that have been given. The questions and answers are grouped into the following four categories for convenient reference: classification, compliance, measurements, and labelling.

The panel is prepared to answer further questions concerning the computing device rules. Inquiries should be in writing, addressed to the Chairman, Computing Device Panel, FCC, Office of Science and Technology, Room 8302, 2025 M St., NW, Washington, D.C. 20554.

The interpretations found in this bulletin apply only to the rules governing computing devices as defined in Section 15.4(n) and do not apply to equipments regulated elsewhere in the FCC Rules.

1.0 CLASSIFICATION

1.1 Q: What does the Commission consider to be a computing device?

A: The definition of a computing device is given in Section 15.4(n) of the Rules (47 CFR 15.4(n)). Briefly, it is any electronic device that uses digital techniques with a clock frequency greater than 10 kHz which is not subject to RF emission requirements set forth elsewhere in the Commission Rules. Computing device peripherals are included in this definition. Devices subject to emission requirements elsewhere in the Commission's Rules, such as radio transmitters or receivers, are excluded from this definition.

1.2 Q: How are computing devices classified for the purpose of regulation?

A: Computing devices are separated into two basic categories--Class A for computing devices marketed for use in a commercial, industrial or business environment and Class B for computing devices marketed for use in a residential environment notwithstanding use in a commercial, business, or industrial environment. These classes are defined in Sections 15.4(o) and (p) of the Rules, respectively. The rationale for classification of a computing device is contained in the First Report & Order and the Reconsideration Order in Docket 20780.

1.3 Q: Are transmitters and receivers which employ microprocessors or digital processing subject to the computing device rules?

A: Transmitters and receivers are regulated elsewhere in the FCC Rules and are not included in the definition of a computing device. Also excluded are Industrial, Scientific and Medical (ISM) equipment such as microwave ovens, RF welders, and medical diathermy, which are regulated by Part 18 of FCC Rules. Radio Frequency (RF) devices regulated by other provisions in Parts 15 and 18 (47 CFR Parts 15 and 18) are also excluded.

1.4 Q: Are any computing devices exempt from the computing device rules?

A: Pursuant to Section 15.801(c), the following computing devices are temporarily exempt from the computing device rules but remain subject to the non-interference requirement of Section 15.803. These exemptions are discussed in paragraphs 52-65 of the Reconsideration Order.

- (1) A computing device utilized in any transportation vehicle including motor vehicles and aircraft.
- (2) An electronic control or power system utilized by a public utility or in an industrial plant.
- (3) Industrial, commercial, and medical test equipment, e.g. spectrum analyzers, oscilloscopes, signal generators, etc. (This exemption does not extend to diagnostic equipment.)
- (4) A computing device utilized in an appliance, e.g. dishwasher, clothes dryer, air conditioner, sewing machine, etc.

1.5 Q: Is a room air conditioner whose operation is controlled by a built-in computer subject to the FCC computer rules?

A: No. Air conditioners, blenders, sewing machines, etc. are considered appliances and are temporarily exempt under Section 15.801(c)(4) from the mandatory labelling and technical requirements for computing devices. Manufacturers of appliances are encouraged to comply with the technical requirements in Subpart J of Part 15 but it is not mandatory.

1.6 Q: Some computer peripherals such as video terminals, modems or printers do not use clock frequencies in excess of 10 kHz or employ digital circuitry. Are such peripherals subject to the computing device rules?

A: Yes. Data exchange or connecting wires and other factors of the printer or other peripherals affect the interference potential of a computer. Therefore, peripherals are subject to the same requirements as a computer. The same would be true for a video terminal or modem which is designed to be connected to a computer system.

1.7 Q: Is there a clear distinction between personal computers and calculators?

A: Personal computers are defined in Section 15.4(q) of the Rules. A more detailed discussion is given in paragraphs 71-77 of the Reconsideration Order in Docket 20780. A hand-held calculator is not considered a personal computer. In most cases, the capability of a computer (add-ons, etc.) will distinguish it from what is considered a calculator.

1.8 Q: Devices such as digital weight scales and digital thermometers are used in both the business and residential environment. Are these classified as Class A or Class B computing devices?

A: If a device is marketed for use in the residential environment, or is widely marketed to the general public, it must meet the technical requirements and be verified as a Class B computing device regardless of the fact that it may also be used in a business environment.

1.9 Q: Is Central Office Telephone Equipment included under the industrial exemption in Section 15.801(c)(2)?

A: A large central office telephone equipment operated by a public utility (telephone company) in a dedicated building or large room owned or leased by the public utility (telephone company) is temporarily exempt from the computer rules under Section 15.801(c)(2). This exemption does not extend to a PBX or other equipment installed in a subscriber's facility regardless of size.

1.10 Q: Must a personal computer peripheral meet the new requirements even if it has no application for currently available equipment and can be used only with computers produced before the FCC requirements were in effect?

A: Yes, a peripheral which is manufactured after January 1, 1981 and is designed to be attached to a personal computer must be certificated by the Commission to show compliance with the requirements for a Class B computing device. For measurement purposes, the peripheral may be tested while connected to a suitable simulator.

1.11 Q: How does the Commission treat a single card computer which may not be furnished with its own power supply?

A: A single card computer which is marketed essentially as a complete personal computer to hobbyists and experimenters must be certificated as a personal computer, pursuant to Section 15.834 of the rules. A single card computer which is built into a large device or system is considered a subassembly and as such is not subject to the rules. However, the completed device is subject to Subpart J of Part 15.

1.12 Q: Are S100 main frame chassis, which include power supply and S100 buss mother boards in one cabinet, subject to the computing device rules? How do S100 main frame manufacturers comply with the new regulations?

A: A manufacturer of a main frame, which includes a S100 buss and power supply, certainly knows which cards will be used in his frame and therefore has the capability to verify compliance with the rules. Moreover, since the frame provides shielding and since individual cards are merely components (or subassemblies) of the complete system (S100 main frame plus cards), we would expect the manufacturer to verify compliance. He may accomplish this by testing the frame with a reasonable number of different types of cards to insure compliance. The frame must be labelled pursuant to Section 15.816 or Section 15.836, whichever is applicable.

1.13 Q: Are individual S100 cards which are marketed by many different manufacturers subject to the rules?

A: An individual card is considered to be a subassembly of a completed S100 main frame system. As such, a card sold by itself is exempt from the computing device rules, pursuant to Section 15.4(n).

1.14 Q: If a unit has been tested and meets the requirements for a Class B computing device, can it be used in a Class A environment without further testing?

A: Yes, the Class B limits are more stringent and compliance with those limits assures that the equipment can meet the Class A limits.

2.0 COMPLIANCE/AUTHORIZATION

2.1 Q: What are the dates for compliance?

A: There are three dates for compliance:

January 1, 1981 for personal computers and electronic games; labelling pursuant to Section 15.805.

October 1, 1981 for computing devices first placed into production after this date.

October 1, 1983 for all remaining computing devices (that were in production prior to October 1, 1981).

2.2 Q: What is certification and verification?

A: Certification is an FCC equipment authorization procedure whereby the subject equipment is tested by the manufacturer and an application for certification containing a report or measurements and other information is submitted to the Commission. Detailed requirements are set forth in Subpart J of Part 2 and Subpart B of Part 15. The Commission may request a sample of the equipment for testing at the FCC Laboratory either prior to or after issuance of grant of certification. Verification (described in Section 2.952) is a procedure whereby the manufacturer tests his product and determines for himself that his device complies with the requirements. Information need not be routinely filed with the Commission under verification.

2.3 Q: If a device is classified as a Class B computing device, is it subject to certification?

A: A Class B computing device does not have to be certificated by the Commission unless certification is specifically required. To date, certification is only required for Class B personal computers, associated peripherals, and electronic games pursuant to Section 15.834. All other Class B computing devices are subject only to verification by the manufacturer.

NOTE: The compliance date January 1, 1981 for certification of coin-operated electronic games has been stayed until further notice in an Order (FCC 80-706) adopted by the Commission on December 4, 1980.

2.4 Q: To what extent can a computing device be changed without it becoming a newly manufactured device, thereby making it subject to the compliance schedules for devices manufactured for the first time?

A: The new rules are intended to give the manufacturer as much flexibility as possible. In general, minor variations such as change in cabinet style or color may be made without affecting the equipment's status insofar as the Commission's timetable is concerned. However, if the device is redesigned, substantially altering its characteristics or capabilities, it is considered a new product and requires the appropriate approval for a newly manufactured device.

2.5 Q: What constitutes "manufacture" of a device for purposes of Subpart J of Part 15?

A: For FCC purposes, manufacture is the construction or assembly of a device which is subject to FCC Rules. Only completed equipments, in the form that would be furnished to the

end user, are subject to the rules. Subassemblies or components of a computing device are not in and of themselves subject to the requirements.

2.6 Q: What are the requirements for peripherals?

A: The interference potential of a computer system can be significantly affected by the device that are attached to the computer via connecting cables or wires. Since many peripherals (terminals, video monitors, floppy disc drives, printers, etc.) are sold separately, it is unrealistic to expect the user, or the manufacturer of the computer to insure compliance of the computers with such separately sold peripherals. In order to obtain some control on the emissions from the system, we are requiring the peripheral manufacturer to measure his peripheral when attached to at least one computer. The user instruction manual for each peripheral should include sufficient information and instructions to insure that the peripheral as used by the purchaser can be expected to comply. The requirements for peripherals are discussed in detail in paragraphs 71-77 of the Reconsideration Order in Docket 20780.

2.7 Q: In the case of a computing device incorporating an electric motor in a single cabinet, will only the emissions generated by the digital circuitry of the computer be subject to the limits in Subpart J of Part 15, particularly where it is possible to separate radio noise emissions of the motor and digital circuitry?

A: No. All emanations from a computing device are subject to the technical requirements in Subpart J of Part 15 including those coming from the motor which is in the same cabinet. In developing its limits for computing devices, the Commission accepted recommendations of the Computer and Business Equipment Manufacturers Association for controlling both narrowband and broadband emanations from computers and similar equipments. This is discussed in detail in paragraphs 49-62 of the First Report and Order in Docket 20780. The Commission is concerned about the interference caused by any part of the equipment--not just from one source within the cabinet.

2.8 Q: What records must a manufacturer keep for Class A and Class B equipment (i.e., photos, schematics, drawings, etc. as well as test data)?

A: For certified equipment, see Section 2.938. For equipment subject to verification see Section 2.955.

2.9 Q: A computer manufacturer has a system that has been granted certification by the Commission as a Class B Computing

Device. Six months later he adds a printer as a peripheral. Is testing needed?

A: Yes. The peripheral must also be tested. It must also be certificated by the Commission.

2.10 Q: Does the compliance date mean manufacturing date or date of entry into the USA? or shipment?

A: Date of manufacture.

2.11 Q: What technical requirements apply to computing equipment exempted under Section 15.801(c)?

A: Exempted computing equipment is subject to the non-interference requirement of Section 15.803. Although the technical requirements in Part 15 Subpart J are not mandatory for exempted equipment, manufacturers are encouraged to comply with these standards.

3.0 MEASUREMENT PROCEDURE

3.1 Q: What are conditions for making radiated emission measurements?

A: The method of measurements is set forth in Appendix A to Part 15, which was adopted by the Commission by Report and Order in General Docket 80-284.

3.2 Q: In the case of a computer system composed of multiple devices according to users' needs, is the standard supposed to be adopted for the whole system (including options), or for each device composing the system?

A: The interference potential of a computer system depends on the configuration and connection of various subcomponents. Testing every possible combination is obviously impractical. We therefore only expect the manufacturer to test his system so that the maximum level of emanation is obtained. Typically, this would mean that representative sample peripherals be attached during testing.

3.3 Q: Is it acceptable to measure radiated emissions in an RF anechoic chamber? If it is acceptable, what requirements must be met by the chamber?

A: Yes, an anechoic chamber is acceptable for making radiated measurements provided the results of measurements made in a particular chamber are capable of being correlated to

results of tests made in an open field.

3.4 Q: What type of measurement instruments are to be used: spectrum analyzer, or selectively tuned voltmeter (field strength meter) having a quasi-peak detector?

A: Measurement of emanations from a computing device may be made with either the spectrum analyzer or a field strength meter (FSM) with a CISPR quasi peak detector. Each instrument has advantages and disadvantages. The spectrum analyzer presents a continuous display of emissions from the equipment under test (EUT) but can be difficult to use for the unskilled operator. The FSM, on the other hand, is more time consuming to use but, because of the quasi-peak mode available on such instruments, will tend to yield lower measured values for broadband emissions. (NOTE: Some manufacturers are known to be developing quasi-peak adaptors for their spectrum analyzers.)

3.5 Q: For peripherals sold separately for connection to various types of personal computers, what kinds of combinations with the main controlling equipment are recommended or suggested in order to ascertain compliance with the technical requirements?

A: A peripheral which is sold separately for connection to various types of personal computers must be attached to at least one personal computer for testing purposes (preferably one that has been certificated). See discussion in paragraph 76 of Reconsideration Order in Docket 20780.

3.6 Q: For devices to which the Commission's verification procedures are applicable, can measurements be taken at a measurement site that has not received the Commission's approval?

A: A measurement site used only for verification does not have to be approved by the Commission (but the Commission may request a test site description if verified equipment is discovered by the FCC to exceed the emissions limits). Manufacturers of an equipment subject to certification, e.g. personal computers, must submit a description of the facility used to perform the tests, pursuant to Section 15.38 of the Rules. (Remarks: Test site descriptions are the subject of another Commission proceeding, FCC Docket 21371 (42 FR 45342)).

3.7 Q: Is verification completely left in the hands of the manufacturer?

A: Under the verification program the manufacturer has considerable flexibility subject only to audits and spot checking by the Commission.

3.8 Q: In testing a peripheral, must it be connected to the computer with which it will work, or can a simulator be used in place of the computer?

A: If a suitable personal computer is not available, a simulator may be employed. See paragraph 76 of the Reconsideration Order in Docket 20780.

3.9 Q: What are the requirements for a simulator which is to be used to test a peripheral.

A: The acceptability of a simulator depends on whether it can fully represent the characteristics and capabilities of the device to which the peripheral would normally be connected. Obviously, this can vary from one peripheral to the next and so we cannot approve a simulator as acceptable for a range of equipments. Instead, an evaluation must be made of whether the simulator is appropriate for a given peripheral using good engineering judgement.

4.0 LABELLING

4.1 Q: What computing devices are affected by the interim labelling requirements of Section 15.805?

A: Section 15.805 applies to all computing devices which require verification that are manufactured after January 1, 1981, until such time as they are verified by the manufacturer to comply.

4.2 Q: Does a product which is verified to comply with the requirements for a Class B computing device need to be labelled? Is the user information required for such a device?

A: Under Section 15.836(c) the manufacturer has the option to label a device that has been verified to comply with the Class B requirements. In general, we would expect the manufacturer to want to advertise this feature of his product. Regardless of whether a Class B device has a label, the user information in Section 15.838 must be inserted into the user manual. The only exception to this requirement is extremely low power miniature computing devices, of the variety which would meet the exceptions in Section 15.838(a). Equipment subject to certification must also meet the labelling requirements in Section 2.1045 of the Rules.

4.3 Q: What are the requirements for labelling a Class A computing device?

A: A computing device manufactured after January 1, 1981, which has not been verified by the manufacturer, must be labelled pursuant to Section 15.805 of the Rules. If the device has been verified to comply with the requirements for a Class A computing device, it must be labelled in accordance with Section 15.816 of the Rules. If it has been verified to comply with Class B requirements, the label is optional pursuant to Section 15.836 of the Rules. Information to the user in the operating manual is required pursuant to Section 15.818 for compliance with Class A limits and Section 15.838 if the Class B limits are met.

4.4 Q: Is there a number required on the label that indicates certification? Is an FCC ID required for devices meeting the Class A and B requirements?

A: Please refer to Sections 2.925, 2.926 and 2.1045 in Part 2 of the FCC Rules (the date October 27, 1980 appearing in the above sections has been extended to May 1, 1981.) In addition, several sections in the recently adopted computing device rules pertain to labelling of computing devices. These are Sections 15.805, 15.816 and 15.836. Sections 15.818 and 15.838 in the new rules contain requirements for information to be provided to the user in operating or instruction manuals for the equipment. The latter sections appear in appendices to the Report and Order and also the Reconsideration Order in Docket 20780. Note that the latter document revised some of the rule sections which appear in the former. An FCC Identifier will be mandatory after May 1, 1981 only for computing devices subject to certification. As you will note from the rules, only certain Class B devices are subject to certification. The verification procedure is applicable to Class A devices and some categories of Class B devices.

4.5 Q: What is considered to be a "conspicuous" place on a unit for placement of the label?

A: Any location readily visible to the user of the device without the use of tools is acceptable for the purpose of these rules.

4.6 Q: How is "permanent" attachment defined?

A: A permanently attached label is a label that can normally be expected to be fastened to equipment during the equipment's expected useful life. A paper gum label will generally not meet this condition.

4.7 Q: Where certification is obtained based on measurements of the system, in which a main control unit and a peripheral are connected together, how should the devices be labelled?

A: For personal computer systems having one or more peripherals, only one label on the main control unit of the computer system is required. If the peripheral is marketed separately, a label must also be attached to the peripheral (See Section 15.836(b)).

4.8 Q: Is it acceptable to insert the user information in the instruction manual as a loose page?

A: The user information must be a permanent part of the operator's manual. Merely inserting a loose page into the manual is not acceptable.

4.9 Q: If a unit is tested and meets the requirements for a Class B computer but is used in a Class A environment, is it necessary or permissible to relabel the unit to a Class A?

A: It is not necessary to relabel Class B equipment which ends up being used in a Class A environment.

